



HOMESCHOOL SCIENCE EXPERIMENT

Making a Model of an Enzyme and Substrate Interaction

Name: _____

Date: _____

Lesson: _____



GOAL

To build a model that shows how an enzyme has a specific shape that fits its substrate, and how the enzyme and substrate interact.



BACKGROUND

Enzymes are proteins that help speed up chemical reactions in living things. Each enzyme has an active site with a specific shape. The substrate is the molecule the enzyme works on. The substrate fits into the active site like a key fits into a lock. After the reaction, the products are released, and the enzyme can be used again.



MATERIALS

- Modeling clay or Play-Doh® (2 colors)
- A second shaped piece (substrate)
- Flat surface or tray
- Paper and pencil



SAFETY

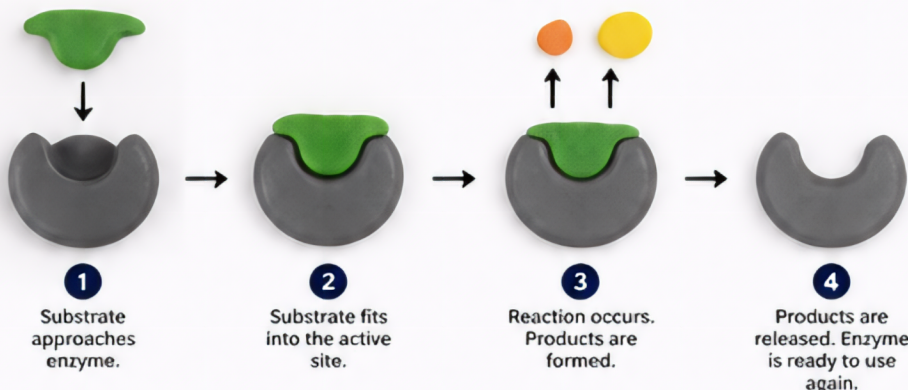
This activity is safe when done with materials as directed. Wash hands after using clay.



PROCEDURE

1. Use one color of clay to shape an enzyme with an active site (make a pocket or indentation with a specific shape).
2. Use the second color to shape a substrate that fits exactly into the active site.
3. Show the substrate binding to the enzyme by placing it into the active site.
4. Remove the substrate and replace it with two or more smaller pieces to represent the products.
5. Remove the products to show they are released and the enzyme is unchanged and ready to be used again.
6. Draw each step and label your model.

ENZYME ACTION



OBSERVATIONS

Draw and label each step of your model in the boxes below.

1

2

3

4

5

What happened in each step? _____



ANALYSIS

1. Why does the substrate fit into the active site? _____
2. What would happen if the substrate shape did not match the active site? _____



CONCLUSION

What did you learn about enzymes and substrates?
